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ABSTRACT

An exploratory study concerned with the measurement of perseveration, or persistence, as a personality variable was based on the work of G.V. Hamilton, an early investigator in the field. Persistently maladaptive behavior was hypothesized to be a chief characteristic of neurosis. An experimental problem-solving situation was designed to demonstrate how neurotic reaction tendencies could be clinically diagnosed through measurement of perseveration. Subjects were presented with an insoluble nonverbal problem. Because the problem was insoluble, persistent attempts to solve it represented neurotic behavior. Results indicated that 75% of the subjects attempted 45 or fewer trials, while less than 20% attempted more than 50 trials, a statistic indicative of neurotic behavior. The instrument, procedures and concepts of this study may be of direct value in the clinical identification of neurosis, but much more experimental work is needed to evaluate their utility. (CS)

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MEASURING NEUROTIC BEHAVIOR

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Measuring Neurotic Behavior

Overview

In the field of individual differences the topic of perseveration, or persistence, has received prominent attention during the past half century. Further, it has also been suggested that next to the subject of intelligence, it has been the most important topic to receive attention in the field of individual differences.

An early investigator in this field, G.V.Hamilton (1925) offered the following definition of a neurotic person: "one whose modes of response to various stimulations are of a kind to interfere more or less seriously with his comfort and efficiency" (p.17). Additionally, he suggested that persistent, obviously non-adjustive behavior is indicative of nervous disorders, and concludes that such forms of reactions are the chief characteristic of neurotic behavior.

As 'explanation' for such behavior, he maintained that this characteristic persistence may be interpreted as a return to a form of behavior which in some previous situation proved efficacious. This concept, of course, is strongly suggestive of the behavior syndrome identified as "regression". Such behavior reflects a reversion to an earlier, well-established mode of conduct, and further, it is accompanied by persistence in that behavior, despite its relative inefficiency in solving the problem confronting the individual.

Past investigations have stressed the importance of persistence in the general study of personality. They have suggested that such persistence is closely associated with degrees of emotional frustration which may either be the result of an immediate situation or the past emotional development of the individual. In this connection, it has also been consistently indicated that the reaction tendency toward neurotic behavior increases as the individual approaches the goal to a problem which he seeks to solve.

In regard to the extensive researches of past years which related to

persistence, these investigations have fallen into three broad categories: (1) those primarily interested in perseveration of words and nonsense syllables; (2) psychiatrists and psychologists investigating the possibility of a relationship existing between reaction types and perseveration; and (3) inquiries interested mainly in the measurement of perseveration as a variable of personality. This pilot study is concerned with the third category. Paralleling this three-way classification, persistence may mean: (1) the tendency of ideas to spontaneously recur; (2) sensory lag or after-effect, marking interference of past activities upon present ones; and (3) a tendency to continue working when there is no defined end in view. Stated summarily, these three persistence phenomena are: (1) recurrence effects; (2) continuance effects; and (3) fixation effects.

The principle underlying this type of reactive (i.e. neurotic) behavior is one common to any discussion of human behavior. It is a generalization which is basic to the psychology of individual differences: all living organisms tend to vary their behavior in accordance with changes in their enviornment. Thus - if the needs of an organism are to be satisfied, its behavior must effectively adapt itself to its environment. If the organism ceases to adapt itself, since it then no longer copes with its environment, it dies.

When an organism does respond, either to physiological drives, changes in its social enviorment, or any environmental change, it is demonstrating a fundamental pattern of behavior which may be designated as its adjustive or adaptive nature. This adaptive characteristic of behavior is explicable, at least partially, in terms of motivation. Simply from direct observation of human behavior, it appears reasonable to assume that few motives ever receive immediate or easy satisfaction. In the environment about us appear to exist hinderances which tend to twart the direct satisfaction of such motives.

Furthermore, these motives, when once aroused, tend to keep the organism in a state of activity until they are consummated. Therefore, it appears quite

reasonable to suggest that the adjustive dimension of behavior is a characteristic necessitated by the fact that by and large our motives do not receive immediate nor complete satisfaction.

Obviously, this simplified outline of adjustive behavior does not address the complexities which characterize the full range of behaviorla reactions. The failings which human ineptitude so often reflect must be considered, for they serve to complicate otherwise simple adjustive behavior patterns. The major differences between 'good' and 'poor' adjustive behavior are cited in Figure 1.

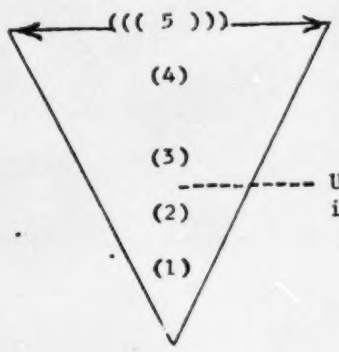
Fig. 1:- Steps in Behavioral Adjustment

Adequate		Inadequate
1	Motivated behavior	A
2	Thwarting	B
3	Trial-and-error	C
4	Surmounting obstacle	
5	Consummation of motive	
	Lack of any specific tension remover	D
	Diffused activity	E

What distinguishes 'good' (adequate) from 'poor' (inadequate) behavioral adjustments? An adequate criterion of 'good' adjustment must take into consideration some integration of behavior patterns. When an individual satisfies all his motives with regard to their functioning as an interrelated system, (i.e. in relation to the other individual motives and to the social environment), such adjustments may be termed 'adequate'.

Schematically, varying levels of behavioral adjustment are indicated in Figure 2.

Fig. 2:- Behavioral adjustment: degrees of adequacy



Legend:
(1) Extreme disintegration of adjustive behavior.
(2) Worry - mild disintegration of adjustive behavior.
(3) Substitute satisfactions - temporary reduction of aroused tension systems; partially adequate adjustment.
(4) Optimum adjustments - complete reduction of tension systems.
(((5))) Range of the potential adjustment value for the various types of behavior.

In Figure 2, the converging lines represent decreasing potential adjustment value of the different types of behavior. For example, when diffuse random activity exists as a result of unsuccessful reduction of a tension system, such behavior would be considered as having no adequate adjustment value. In a similar fashion, where complete reduction of tension takes place, this form of behavior is regarded as being of optimum adjustment value; the wide range of substitute satisfactions occupying the position of partially adequate adjustments.

With further reference to Figure 2, beyond the range of adequate adjustments lie the inadequate adjustments, sometimes identified as maladjusted behavior. These are the behavioral responses which cannot, under any circumstance, be regarded as adequate adjustment modes for they simply do not meet the criterion for adequate behavioral responses.

Such maladjusted behavior evidences a high degree of personal and social inadequacy which reflects a failure to reduce an aroused tension system. Maladjusted behavior may be classified into one of three principal classifications. These are: (1) persistent visceral states as expressions of unreduced tension systems; (2) diffused motor activity expressed as random and repeated useless

movements - (persistent behavior); and (3) worry and anxiety states varying from concern about specific immediate problems, to a broader state of anxiety concerning all adjustive situations which may be encountered. Persistence in mental activity which is circular; i.e. does not lead to solution of the problem.

Hamilton (1925) maintained that the characteristic symptom of all maladjusted behavior is its persistent, non-adjustive, affective reaction to major cravings or disabilities. He further maintained that such responses should be interpreted as the return to a form of behavior which in some former situation proved effective. His view is supported by the study of Krechevsky & Hamilton (1933) in which they employed the term "regression" to describe the principal characteristic of maladjusted behavior. In their words - "regression may be defined as the reversion to an earlier well-established mode of behavior, and persistence (underlining added) in that mode despite the relative inefficieny of that behavior in solving the problem confronting the organism. Further, regression has been assumed to arise when the individual is placed in a strong emotional situation" (p.283).

These earlier investigators; Hamilton (1925), Krechevsky & Hamilton (1933), and Shaeffer (1936) imply that the diffused activity characteristic of maladjustive behavior is the expression of an unadaptiveness and social inadequacy which is further characterized by its persistent nature. In essence, they all contend that maladjustive behavior is characterized by persistence in behavioral responses which are relatively ineffective in the solution of problems.

Testing for Neurotic Reactions

Returning to Hamilton's (1925) definition of neurotic behavior, any problem-situation which would present the opportunity for demonstrating such persistent, obviously non-adjustive behavior would be, ipso facto, a test of the neurotic reaction tendency. Empirically, apparatus and procedures were designed to measure such behavior. The subjects tested were 100 students, randomly selected from several introductory psychology sections at a large, northeastern

university. The sole criterion for their selection as subjects was their availability to spend a half-hour in the testing session.

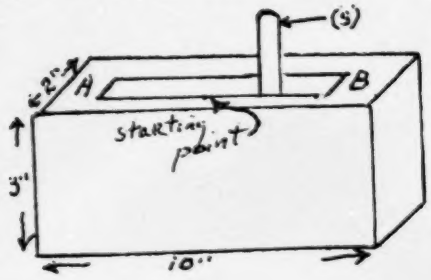
These subjects were presented with a problem impossible of solution. They, however, were not aware of this fact. The subjects were highly motivated to solve this problem, and in accordance with the instructions they received, they could readily determine that this problem was impossible to solve. Therefore, under these circumstances, persistent attemptsto solve this problem would be non-adjustive types of response. In short - each subject was given the opportunity to demonstrate either neurotic behavior by persisting in his attempt to solve what he rationally knew was an impossible problem, or to make a reasoned adjustment by giving up trying to solve the problem.

The first criterion necessary to be met in testing session was a situation appearing sufficiently important to the individual to elicit more than mere idle effort. In this connection, results of several studies suggested that the reaction tendency toward neurotic behavior increases as the individual approaches a goal for which he is striving. Demonstrated experimentally, it was found that the strength of the activity directed to the reduction of a tension system is a function of nearness of goal, increasing as the goal is approached. Thus, the first criterion of strong motivation was met by having each subject start work on the fourth problem with: (1) three previous successes, (i.e. problems he solved), and (2) the knowledge that the fourth problem was the last to be solved.

The second criterion was that even to the relatively unintelligent individual, it must be quite clear to him that he is faced (in the fourth problem) with one incapable of solution. Obviously this is a very important requirement for if the individual is not aware of this fact, there is no justification in assuming that any demonstrated persistence is 'obviously non-adjustive behavior'. To assure clear understanding of this very important criterion, for each of the 100 subjects a demonstration problem was given and questions were carefully answered before the testing session began.

The third and concluding criterion was that the problem-solving test must be an objective technique; i.e. a test that is readily observable and the records objective - not dependent upon evaluation by the experimentor. To meet these requirements, a stylus-maze was designed as the apparatus for testing the subjects. It is portrayed in Figure 4.

Figure 4:- Stylus-maze Apparatus



The apparatus was built of wood and painted black. The stylus (Fig. 4 (s)) could move freely in the horizontal plane but could not be moved vertically as it was pinned to a small piece of wood at its base which ran along a groove cut into the 10" side walls. Using this apparatus, it was possible to secure a quantitative record of persistence, three kinds of data being collected. These were: (1) total number of trials beyond the 'critical' combination(See Fig.4 (x)) ; (2) total number of different letter patterns beyond the 'critical' combination (See Fog. 4 (z's); and (3) total amount of time spent on the last problem. The detailed instructions read to each subject are contained in Appendix A.

Fig.4:- Sample Record of Data Collected

Problem #1:	#2:	#3:	#4:
aba	bab	bba	ba
baba	bbaab	aabba	abba
aaba	bbbab	abba	aba
aba	baab	bba	ba .... (x)
	bab		aba .... (z)
			aaba ... (z)
			ba ..... (z)

For problem #4:
total trials score = 4
total patterns score = 3

Since the principal focus in this study rested with the dimension of persistence, the most direct evidence to illustrate this type of behavior would be the total number of trials beyond the 'critical' combination (See Fig. 4(x). In the case of problems # 1,2, and 3, the specific underlined letter patterns in Figure 4 were used - in all cases. Thus each subject solved a standardized series of three problems before being challenged by the fourth one.

For each subject, the actual pattern selected for the fourth problem was determined as follows. If the subject started on the fourth problem with the letter "b", the series "ab" was selected by the experimentor, and conversely, if the subject first selected "a", then the series "ba" was selected by the experimentor as the problem to be solved. However - when the subject succeeded in tracing out the pattern "ab" (or "ba") in a single trial (See Fig 4: (x)) he received the cue word "STOP", not "CORRECT". In addition, the subject received no cue word for tracing either "a" or "b" alone.

Under these circumstances; i.e. considering the specific and precise instructions for the use of the cue words "STOP" and "CORRECT", it should quickly become apparent to a reasonably intelligent individual that problem 4 has no solution ! Consequently, each trial after the one in which "ab" (or "BA") alone is traced may be regarded as clear evidence of persisting, in the face of known instructions, in a form of behavior which is clearly non-adjustive for that specific situation.

Regarding the time element data, each subject was permitted a uniform period of twenty minutes to seek a solution to problem #4 if he wished to use that much time - and some did ! With the time taken for the preliminary instructions and demonstration for the sample problem, as well as the time used to solve the first three problems, the entire testing period for each subject did not exceed thirty minutes.

Since this experimental test for identifying neurotic behavior was designed on the basis of a definition of persistence, it logically follows that

its validity rests entirely with this definition. Regarding its reliability, currently there is no measure of it. However, its reliability might be determined at some future time in the following manner. Readminister the experimental test, altering the technical setup by including 6 problems before the 'impossible' one is given. If those individuals who scored 'high' in the initial administration again score 'high' upon retest, and those who scored 'low' in the first administration again score 'low', this would be strong evidence that the technique yields reliable results; i.e. is consistent from one administration to the next. In the second test administration, motivation would be greater for the entire group owing to a greater amount of success; i.e. they would have five problems successfully solved as compared with three successes in the first administration. Therefore, if the relative order of the 'high' and 'low' scores remained the same, or substantially so, these results would indicate a reliable instrument and technique.

Findings and Conclusions

The data generated through the administration of this instrument included the following: (1) total number of trials after 'critical' combination (Fig. 4 (x)); (2) number of repetitions of same letter patterns after the 'critical' combination; (3) number of different patterns after 'critical' combination; and (4) time spent, after 'critical' combination, in working on the 'impossible' fourth problem.

Product-moment correlations were computed for the various combinations nited in Figure 5.

Fig. 5:- Product-Moment Correlations

1. Trials& Time r = 0.3 standard error = .14
2. Trials & Repetitions r = 0.9 st. er. = .03
3. Trials & Patterns r = 0.5 st. er. = .12

As Figure 5 reveals, Trials & Repetitions are virtually synonymous as

measures of this type of behavior. As might also be anticipated, Trials & Patterns evidence a moderate positive correlation. This is in consonance with the definition of neurotic reactions in which the chief characteristic is persistence. The additional different patterns used after the 'critical' combination may be considered as maladjustive since each different pattern tried indicates additional divergence from what the subject knows; i.e. that in the light of the instructions, the #4 problem is impossible of solution. One would also expect a positive correlation between Trials & Time, for a measure of one presupposes a measure of the other. However - the correlation need not necessarily be a high one since no effort was made to control the speed of tracing out the patterns, nor was a record kept of the variations in time intervals between the trials.

A frequency distribution of the total trials scores beyond the 'critical' combination indicated a very marked bunching of scores at the lower number of trials end. Some 75% of these 100 subjects scored 45 or fewer trials, with a majority (52%) scoring 21 or fewer trials. The range of trials was 1 to 185, with only 7 scoring more than 80 trials and less than 20 subjects scoring more than 50 trials. This type of distribution would be anticipated for persistence of non-adjustive behavior, (i.e. trying to 'solve' an impossible problem) has been hypothesized as an element characteristic of neurotic behavior. Such marked persistent behavior should not be a common characteristic of the normal, well-adjusted individual.

That the group sample tested was an adequate one is indicated by the following statistical evidence. Arithmetic means for the total trials beyond 'critical' combination for the odd and even numbered subjects were computed. This value was 31.30 for the odds and 31.08 for the evens. The critical ratio indicates that from the viewpoint of statistical significance there is no reliable difference between the two groups. Chances are only 51 in 100 that the

difference obtained may be a true one. Additionally, this same conclusion is true of the variabilities of the groups since the sigmas of the odds was 35.23 and of the evens 32.53. Chances here are only 73 in 100 that the difference obtained may be a real one - again far less than the 5% level of confidence.

Summary

The instrument, procedures, and concepts discussed in this paper may present materials of possible value to clinical psychologists, and other, in connection with investigations of neurotic behavior. Having the advantage of being non-verbal, and avoiding the difficulties of a paper-pencil type of test, it may prove to be of direct value in the diagnosis of neurotics.

However, in order to lay claim to these possibilities the test instrument and procedures were designed to meet the three criteria necessitated by Hamilton's (1925) concept of neurotic behavior in which persistent, obviously non-adjustive reaction tendencies are its chief characteristic. These criteria are: (1) a problem situation in which the subject is strongly motivated; (2) one clearly defined as to impossibility of problem solution, and (3) objectivity of data and procedures.

The investigation reported here is but a preliminary study in which a technique was developed and demonstrated in performance. Much further experimental work is needed before its possibilities of practical application as a clinical instrument can be evaluated.

1980

Appendix A

Instructions for Neurotic Behavior Test

"This is a test of problem-solving ability. You will attempt to duplicate different combinations of the letter "A" and "B" (pointing to apparatus) which I have in mind. You will show me what your selections are by moving the pointer (indicate stylus pointer) from the place marked Starting Point to either of the places marked "A" or "B" and back to the Starting Point again, based upon which of the two letters you wish to designate. (demonstrate for subject by moving the stylus in accordance with this instruction). Since you do not know what combination of letter I have in mind, you must start in a purely random fashion, selecting the letters in any order you wish. Rather shortly after you start you will be stopped with the cue word STOP! This word is very important for it tells you two things: (1) you now know that included in the combination of letters you have selected is the correct answer to the problem; and (2) this word STOP also means that there are more letters in the combination you selected than in the correct combination I have in mind. Therefore, your problem from the first time I say "STOP" is to attempt to eliminate the extra letters, or letter in your following trials. By definition - a trial consists of all letters traced out by you between two successive cue words - "STOP". When you finally succeed in tracing out the correct combination which consists of the CORRECT NUMBER OF LETTERS AS THEY APPEAR IN THE CORRECT ANSWER I HAVE IN MIND. (this capitalized phrase is repeated) - without any extra letters included in that trial - you will then receive from me the cue word "CORRECT". This tells you that you have solved this problem. You will then attempt to solve the next problem in the same fashion. There are four problems to solve. However, you do not know before you start each problem how many letter appear in the correct answer. You may talk all you wish throughout the test period, however - once we begin you may not ask any questions pertaining directly to the test."

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